

WHAT IS CLAIMED IS:

1. A multi-layer nonwoven sheet comprising:
 - (a) a spunbond nonwoven layer having an inner surface and an outer surface and a hydrostatic head of at least about 15 cm, the spunbond nonwoven layer comprising continuous spunbond fibers having an average fiber diameter of less than 10 microns, the surface of the spunbond fibers comprising a polymer having a surface tension of at least about 25 dynes/cm;
 - (b) a second layer having an inner surface and an outer surface, selected from the group consisting of nonwoven fabrics, knitted fabrics, woven fabrics, and films; and
 - (c) a polymeric adhesive which adheres at least a portion of the inner surfaces of the spunbond layer and the second layer together wherein the polymeric adhesive is derived from a water-based adhesive composition.
2. The multi-layer nonwoven sheet of claim 1 wherein the spunbond fibers have an average fiber diameter of no greater than about 8 microns.
3. The multi-layer nonwoven sheet of claim 1 wherein the polymer having a surface tension of at least about 25 dynes/cm is selected from the group consisting of polyolefins, polyesters, polyamides, polystyrenes, and blends and copolymers thereof.
4. The multi-layer nonwoven sheet of claim 3 wherein the polymer having a surface tension of at least about 25 dynes/cm is selected from the group consisting of polyester copolymers and polyethylenes.
5. The multi-layer nonwoven sheet of claim 4 wherein the polymer having a surface tension of at least about 25 dynes/cm is a poly(ethylene terephthalate) copolymer.
6. The multi-layer nonwoven sheet of claim 5 wherein the poly(ethylene terephthalate) copolymer is selected from the group consisting of poly(ethylene terephthalate) modified with isophthalic acid and poly(ethylene terephthalate) modified with 1,4-cyclohexanedimethanol.

7. The multi-layer nonwoven sheet of claim 4 wherein the spunbond fibers are sheath-core multiple component fibers wherein the sheath comprises the polymer having a surface tension of at least 25 dynes/cm.
- 5 8. The multi-layer nonwoven sheet of claim 7 wherein the core comprises a polyester.
9. The multi-layer nonwoven sheet of claim 8 wherein the core comprises poly(ethylene terephthalate).
- 10 10. The multi-layer sheet of either of claims 1 or 4 wherein the second layer comprises a nonwoven fabric.
11. The multi-layer sheet of claim 10 wherein the second layer comprises a nonwoven fabric selected from the group consisting of spunbond fabrics and nonwoven fabrics comprising at least one meltblown layer and at least one spunbond layer.
- 15 12. The multi-layer sheet of claim 11 wherein the second layer comprises a spunbond nonwoven layer comprising continuous spunbond fibers, the surface of the spunbond fibers comprising a polymer having a surface tension of at least about 25 dynes/cm.
- 20 13. A multi-layer nonwoven sheet comprising:
- 25 (a) a first layer comprising a first spunbond-meltblown-spunbond nonwoven fabric having an inner surface and an outer surface, wherein the meltblown layer comprises meltblown fibers, the surface of the meltblown fibers comprising a first polymeric component having a surface tension of at least about 25
- 30 dynes/cm;
- 31 (b) a second layer having an inner surface and an outer surface, selected from the group consisting of nonwoven fabrics, knitted fabrics, woven fabrics, and films; and
- 32 (c) a polymeric adhesive which adheres at least a portion of the
- 35 inner surfaces of the first layer and the second layer together, wherein the polymeric adhesive is derived from a water-based adhesive composition.

14. The multi-layer nonwoven sheet of claim 13 wherein the first polymeric component comprises polyethylene.
15. The multi-layer nonwoven sheet of claim 13 wherein the first polymeric component has a surface tension of at least about 40 dynes/cm.
16. The multi-layer nonwoven sheet of claim 15 wherein the first polymeric component comprises a polyester.
17. The multi-layer nonwoven sheet of claim 16 wherein the meltblown fibers comprise bicomponent fibers.
18. The multi-layer nonwoven sheet of claim 17 wherein the meltblown fibers further comprise a second polymeric component comprising polyethylene, and the polyester and polyethylene components are arranged in a side-by-side configuration.
19. The multi-layer nonwoven sheet of any of claims 16-18 wherein the polyester comprises poly(ethylene terephthalate).
20. The multi-layer nonwoven sheet of either of claims 13 or 15 wherein the inner surface of the first layer comprises continuous spunbond fibers, the surface of the spunbond fibers comprising a polymer selected from the group consisting of polyolefins, polyesters, polyamides, polystyrene, and blends and copolymers thereof.
21. The multi-layer nonwoven sheet of claim 20 wherein the polymer comprising the surface of the spunbond fibers is selected from the group consisting of polyethylenes, polyesters, and blends and co-polymers thereof.
22. The multi-layer nonwoven sheet of either of claims 13 or 15 wherein the second layer is a nonwoven fabric.
23. The multi-layer nonwoven sheet of claim 22 wherein the second layer comprises a second spunbond-meltblown-spunbond nonwoven fabric.

24. The multi-layer nonwoven sheet of claim 23 wherein the second spunbond-meltblown-spunbond nonwoven fabric is the same as the first spunbond-meltblown-spunbond nonwoven fabric.
- 5 25. The multi-layer nonwoven sheet of claim 22 wherein the second layer comprises a spunlaced fabric.
26. The multi-layer nonwoven sheet of claim 13 wherein the adhesive layer comprises a discontinuous pattern of the polymeric adhesive.
- 10 27. The multi-layer nonwoven sheet of claim 13 wherein the polymeric adhesive is applied to the perimeter of at least one of the layers.
28. A medical garment comprising a base sheet material and at least one multi-layer zone, the multi-layer zone comprising a first spunbond-meltblown-spunbond nonwoven fabric adhered to the base sheet by a polymeric adhesive derived from a water-based adhesive composition, wherein the meltblown layer comprises meltblown fibers having a surface comprising a first polymeric component having a surface tension of at least about 25 dynes/cm.
- 15 29. The medical garment of claim 28 wherein the first polymeric component comprises polyethylene.
- 25 30. The medical garment of claim 28 wherein the first polymeric component has a surface tension of at least about 40 dynes/cm.
31. The medical garment of claim 30 wherein the first polymeric component is selected from the group consisting of poly(ethylene terephthalate) and copolymers of poly(ethylene terephthalate).
- 30 32. The medical garment of claim 28 wherein the surface of the meltblown fibers further comprises a second polymeric component.
- 35 33. The medical garment of claim 32 wherein the first polymeric component comprises polyethylene and the second polymeric component comprises a polyester.

34. The medical garment of claim 33 wherein the polyester is poly(ethylene terephthalate) and the first and second polymeric components are arranged in a side-by-side configuration.
- 5 35. The medical garment of claim 34 wherein the base sheet comprises a second spunbond-meltblown-spunbond nonwoven fabric.
36. The medical garment of claim 35 wherein the first and second spunbond-meltblown-spunbond nonwoven fabrics are each treated with a
10 fluorochemical prior to being adhered together by the polymeric adhesive composition.
37. The medical garment of claim 36 wherein the first and second spunbond-meltblown-spunbond nonwoven fabrics are the same.
- 15 38. A medical garment comprising a base sheet and at least one multi-layer zone, the multi-layer zone comprising a spunbond nonwoven fabric adhered to the base sheet by a polymeric adhesive derived from a water-based adhesive composition, wherein the spunbond nonwoven has a
20 hydrostatic head of at least about 15 cm and comprises continuous spunbond fibers having an average fiber diameter of less than 10 microns, the surface of the spunbond fibers comprising a polymer having a surface tension of at least about 25 dynes/cm.
- 25 39. The medical garment of claim 38 wherein the polymer comprising the surface tension of at least 25 dynes/cm is selected from the group consisting of polyethylene and polyester copolymers.
40. The medical garment of claim 39 wherein the spunbond fibers
30 comprise multiple component sheath/core fibers selected from the group consisting of polyethylene sheath/polyester core fibers and polyester copolymer sheath/polyester core fibers.
41. The medical garment of claim 40 wherein the spunbond fibers
35 comprise poly(ethylene terephthalate) copolymer sheath/poly(ethylene terephthalate) core fibers.

42. A method for forming a multi-layer adhesive-bonded nonwoven sheet comprising the steps of:

- 5 (a) providing a first layer comprising a spunbond-meltblown-spunbond nonwoven fabric having an inner surface and an outer surface, wherein the meltblown layer comprises meltblown fibers, the surface of the meltblown fibers comprising a first polymeric component having a surface tension of at least about 25 dynes/cm;
- 10 (b) providing a second layer having an inner surface and an outer surface, selected from the group consisting of nonwoven fabrics, knitted fabrics, woven fabrics, and films;
- (c) applying a water-based adhesive composition to at least a portion of at least one of the inner surface of the first layer or the inner surface of the second layer; and
- 15 (d) contacting the inner surface side of the first layer and the inner surface side of the second layer to adhere the surfaces together.

43. The method of claim 42 wherein the first polymeric component has a surface tension of at least about 40 dynes/cm.

20 44. The method of claim 42 wherein the first polymeric component comprises polyethylene and the meltblown fibers further comprise a second polymeric component comprising poly(ethylene terephthalate) arranged in a side-by-side configuration with the first polymeric component.

25 45. The method of claim 42 further comprising the step of drying the multi-layer adhesive-bonded nonwoven sheet at a temperature between about 15°C and 30°C.

30 46. A method for forming a multi-layer adhesive-bonded nonwoven fabric comprising the steps of:

- 35 (a) providing a spunbond nonwoven layer having a hydrohead of at least about 15 cm and comprising continuous spunbond fibers having an average fiber diameter of less than 10 microns, the surface of the spunbond fibers comprising a polymer having a surface tension of at least about 25 dynes/cm and the spunbond layer having an inner surface and an outer surface;

- (b) providing a second layer having an inner surface and an outer surface, selected from the group consisting of nonwoven fabrics, knitted fabrics, woven fabrics, and films;
- 5 (c) applying a water-based adhesive composition to at least a portion of at least one of the inner surface of the first layer or the inner surface of the second layer; and
- (d) contacting the inner surface side of the spunbond nonwoven layer and the inner surface side of the second layer to adhere the surfaces together.

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